

REMARKS

In the January 9, 2006 Office Action, claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,230,713 to Schauer in view of Applicants' Admitted Prior Art and further in view of U.S. Patent No. 6,032,358 to Carroll, and claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schauer, as modified by Applicants' Admitted Prior and Carroll, in view of U.S. Patent No. 5,735,697 to Muzslay.

The rejections over prior art are respectfully traversed because none of the prior art either alone or in combination discloses, teaches or suggests a flat cable for a clockspring with conductors printed onto one of the insulating layers of the cable so that a thin layer of conductive material resides on an interior surface of the one of the insulating layers, as recited in amended claims 1 and 6. Each rejection is addressed in detail below.

Claim Rejections – 35 U.S.C. 103(a)

Claims 1-9 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over U.S. Patent No. 5,230,713 to Schauer in view of Applicants' Admitted Prior Art and further in view of U.S. Patent No. 6,032,358 to Carroll. A prima facie case of obviousness has not been established because there is no motivation to combine Carroll with Schauer and Applicants' Admitted Prior Art; and even if combined, the combination fails to teaches all of the limitations of the claimed invention, particularly conductors that both reside on an interior surface of an insulating layer and are printed onto the insulating layer, as recited in the claimed invention.

As best understood, the Examiner appears to maintain that the method of forming, i.e. printing, the device is not germane to the patentability of the device itself. Applicants note that apparatus claims may recite either structural and/or functional features. See MPEP §

2114. Moreover, contrary to the assertion in the Office Action, independent claims 1 and 6 do not recite a method of printing conductors on an insulating layer. Instead, the claimed invention recites conductors printed onto the insulating layer. Therefore, the claim invention does not cover what the cable does but covers what the cable is, that is including conductors printed onto one of its insulating layers, as is permissible. Furthermore, the claimed invention distinguishes the prior art, such as Applicants' Admitted Prior Art, by its structure and not by its function. More specifically, the cable of Applicants' Admitted Prior Art includes conductors adhesively bonded to the insulating layers. In contrast, the claimed invention recites a cable which includes conductors printed on the insulating layer. Moreover, the claimed invention recites that conductive material resides on the interior surface of the insulating layer. That is unlike the cable of Applicants' Admitted Prior Art in which the conductors reside on an adhesive layer between the insulating layers and conductors. See page 3, lines 16-18 of Applicants' specification.

Additionally, the claimed invention must be considered as a whole. See MPEP 2141.02. Therefore, claim limitations, such as conductors printed on the insulating layers, cannot be disregarded. *Jones v. Hardy*, 727 F.2d 1524, 1530 (Fed. Cir. 1984). Furthermore Applicants previously amended independent claims 1 and 6 to clarify the structural features of printed conductors, that is a thin layer of conductive material residing on an interior surface of the insulating layer. Accordingly, the claim limitation of "conductors printed onto one of the insulating layers" should be given patentable weight along with the remaining limitations of independent claims 1 and 6.

None of Schauer, Applicants' Admitted Prior Art, Carroll, or any combination thereof teaches or suggests a flat cable with conductors printed onto an insulating layer of the cable so that a thin layer of conductive material resides on an interior surface of one of the insulating layers.

Schauer discloses a ribbon cable 10 with conductors 11 soldered to contacts 14 fastened in an insulative contact holder 17 (col. 3, lines 55-59 and col. 4 lines 3-6). The Examiner's assertion that the conductors 11 of Schauer are thin and therefore meet the claimed limitation is misplaced because the claimed invention recites that conductive material resides on the interior surface. No evidence is provided in the Office Action that Schuaer teaches that the conductors 11 reside on an interior surface of the cable 10. Moreover, inherency requires that the element be necessarily present in the prior art. Nothing in Schauer suggests that the conductors 11 must necessarily reside on the interior surface of the cable 10. One skilled in the art would recognize that the conventional ribbon cable 10 of Schauer likely uses an adhesive layer between the cable and conductors, thereby preventing the conductors from residing on the interior surface of the cable.

Applicants' Admitted Prior Art discloses a flat cable 10 with conductors 20 adhesively bonded between two transparent insulating layers. As discussed above, the conductors 20 cannot reside on the interior surface of either insulating layer because an adhesive layer is disposed between the conductors 20 and the insulating layers.

Furthermore, as admitted in the Office Action, the combination of Schauer and Applicants' Admitted Prior Art fails to teach conductors printed on an insulating layer of the cable.

Carroll fails to cure the deficiencies of the combination of Schauer and Applicants' Admitted Prior Art. Nothing in Carroll teaches or suggests conductors located between two insulating layers of a flat cable with the conductors printed on one of those layers so that a thin layer of conductive material resides on an interior surface of the layer, as recited in amended claims 1 and 6. Carroll only describes related art as including a flexible circuit that includes a dielectric substrate with conductive inks printed on its surface to define circuit traces.

Moreover, one skilled in the art would not be motivated to modify Schauer and/or Applicants' Admitted Prior Art in view of Carroll to improve the terminal to flexible circuit mounting arrangement, as suggested. Carroll merely teaches a flexible substrate that includes patterns (Figs. 2a – 2d) cut into the substrate for receiving a terminal pin, as seen in Figs. 4 and 5. The cuts in the substrate of Carroll provide an improved solderless connection. There is no link or suggestion in Carroll between the solderless connection and printed conductors, much less a suggestion that the dielectric substrate with conductive inks printed on its surface to define circuit traces mentioned in Carroll improves a terminal to flexible circuit mounting arrangement. Additionally, the Examiner has provided no rationale for how the dielectric substrate with conductive inks printed on its surface to define circuit traces mentioned in Carroll would improve the terminal to flexible circuit mounting arrangement. In fact, if Carroll were combined with Schauer and Applicants' Admitted Prior Art as suggested, it would result in patterns cut into the cable of the combination of Schauer with Applicants' Admitted Prior Art, and would not result in conductors printed on a layer of the cable.

The Examiner's secondary motivation that Carroll's substrate printed conductors permits flexible bending of the substrate to accommodate locating the flexible circuit in applications where a less rigid printed circuit is required is misplaced. In particular, both Schauer and Applicants' Admitted prior art already teach a flexible cable. Therefore, to suggest that one skilled in the art would be motivated to modify an already flexible cable to have flexible bending is illogical.

Therefore, the motivation asserted in the Office Action for combining Carroll with Schauer and Applicants' Admitted prior art is untenable. One skilled in the art would not be motivated to combine the teachings of Carroll with Schauer and Applicants' Admitted Prior Art to teach the claimed invention.

In view of the above, Applicants believe a prima facie case of obviousness has not been established. Therefore, Applicants request reconsideration and withdrawal of the rejection of independent claims 1 and 6 under 35 U.S.C. 103(a).

Dependent claims 2-5 and 7-10 are also allowable for the same reasons. Moreover, these claims recite additional features not found in the prior art. For example, claims 3 and 7 recite that the contacts on the mounting header are curved to provide a larger surface area for connection to the conductors in the flat cable. In contrast, the conductors 14 of Schauer are molded or inserted in the holder 17 and therefore do not provide a greater surface area for connection. It is striker parts 29 of Schauer that provide the greater surface areas or flat zones for soldering the conductors 11 to the conductors 14, as seen in Fig. 6 and described on col. 4, lines 52 – 55. The striker parts 29 are not curved. The bent portions of conductors 14 of Schauer are encased in the holder 17 and therefore those bent portions could not connect to anything.

Regarding dependent claims 4 and 8, the Office Action asserts that the combination of Schauer, Applicants' Admitted Prior Art and Carroll teaches pads which are soldered to contacts. However, that is in conflict the solderless connection taught by Carroll. Therefore, dependent claims 4 and 8, which specifically recite a solder, are per se distinct from the combination of Schauer, Applicants' Admitted Prior Art and Carroll which eliminates the solder.

Also, claims 5 and 9, as amended, recite that the contacts on the mounting header are straight and are inserted through circular apertures on the flat cable and secured to the apertures for electrical connection to the conductors. Although Carroll teaches pins 80 inserted through apertures 80, the apertures 80 are made in conjunction with flaps 74 designed to create a wiping action, thereby obviating the need for soldering. In contrast, claims 5 and 9 recite that the contacts are secured to the circular apertures. For example, the

conductors 66 of the application can be secured to the apertures 62 by soldering (see page 9, lines 9-12 of Applicants' disclosure). One skilled in the art would not use the pin and aperture arrangement as taught by Carroll to secure contacts to apertures, such as by soldering, because the electrical traces 20 of Carroll are coated on the wrong side of the substrate 42. More specifically, the pin 90 of Carroll would have to be inserted from the side on which the traces are coated in order for the substrate to function as a female electrical connector (see col. 4, lines 56-67), thereby making the area with the conductive coating inaccessible for securing the connection, such as by a soldering apparatus.

Claim 10 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Schauer, as modified by Applicants' Admitted Prior Art and Carroll, in view of U.S. Patent No. 5,735,697 to Muzslay. Initially, because claim 10 depends from claim 1, claim 10 is allowable for the same reasons discussed above.

The Office Action first asserts that moving the Schauer holder 17 from the end portion of the ribbon 10 to an intermediate portion is an obvious rearrangement of parts. However, locating the mounting header of the claimed invention on an intermediate portion of the flat cable is not a mere rearrangement of parts but instead facilitates the incorporation of two extended electrical signal lines and associated connectors into a single assembly. This incorporation obviates the need for two additional wire harnesses and at least one additional connector, which would have otherwise been required.

The Office Action next asserts that Muzslay shows substantially the same structure as the claimed invention. The Office Action suggests that the drawings must be evaluated for what they reasonably disclose. However, the figures of Muzslay could not be interpreted as teaching a mounting header located at an intermediate portion. That is because, if connector 12A of Muzslay is interpreted as the mounting header located at an intermediate portion, then the portions 130S and 130Q cannot be characterized as extensions, but rather must be

characterized as opposite extreme portions. Alternatively, if portions 130S and 130Q are interpreted as extensions, then the connector 12A must be characterized as an extreme instead of an intermediate portion. Nothing in the Office Action rebuts this argument.

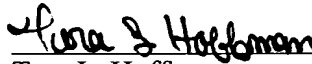
Therefore, a prima facie case of obviousness has not been established with respect to claim 10. Thus, Applicants believe the rejection of claim 10 under 35 U.S.C. 103(a) should be withdrawn and the claim allowed.

In view of the foregoing, claims 1-10 are believed to be in allowable condition.
Prompt and favorable treatment is respectfully solicited.

Please charge any shortage of fees or credit any overpayment thereof to BLANK ROME, LLP, Deposit Account No. 23-2185 (115584-00343).

Respectfully submitted,

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Tara L. Hoffman
Reg. No. 28,680

BLANK ROME LLP
600 New Hampshire Avenue
Washington, D.C. 20037
(202) 772-5800